The coding control portion 11 controls coding processing of the coding portion 12 in such a manner that coding processing is conducted with the same picture type as that detected by the picture type detector 52. Because of this, re-coding processing can be conducted with less image quality deterioration.

Furthermore, the coding control portion 11 controls the coding portion by setting an intended code amount in accordance with the detected picture type. Because of this, a code amount can be distributed so as to be appropriate for a bit rate of the bit stream 33 output in re-coding processing.

It is also effective that, among sixty-four frequency components, a plurality of DCT coefficients are specified as low-frequency components (e.g., sixteen unmarked portions in FIG. 2) and high-frequency components (e.g., sixteen shaded portions in FIG. 2), and the sum of absolute values/sum of squares of these plural coefficients are obtained collectively in the DCT coefficient counter 51. In this case, the number of power values 62 to be output is not sixty-four, but they are outputted corresponding to a predetermined number of components.

In the case where one frame signal is an interlace signal composed of two field signals, there are a method for coding two field signals independently (called a field configuration in the case of MPEG-2), and a method for coding two field signals collectively (called a frame configuration in the case of MPEG-2). In the case of the frame configuration, two field signals are alternately disposed, so that one block occupies a substantially square portion (a horizontal side and a vertical side are almost equal to each other) on a screen. In the case of the field configuration, only one field signal is disposed, so that one block occupies a rectangular portion (a

vertical side is almost twice as long as a horizontal side). Therefore, it is known that, in the case of an interlace signal, the correlation in the vertical direction becomes lower than that in the horizontal direction both in the field configuration and the frame configuration.

Therefore, in the case where an input image signal is an interlace signal, a number of signals are generated in high-frequency components in the vertical direction. Therefore, a picture type is detected using low-frequency components (e.g., a region of the horizontal line portions in FIG 2) and high-frequency components (e.g., a region of shaded portions in FIG. 2) in the horizontal direction, without using low-frequency components and high-frequency components in the vertical direction. Because of this a detection precision can be enhanced.

Embodiment 2

Next, an apparatus for re-coding an image signal of Embodiment 2 will be described.

The configuration of the apparatus for re-coding an image signal of Embodiment 2 is the same as that of Embodiment 1 shown in FIG. 1.

Herein, a DCT coefficient counter 51 of Embodiment 2 is previously set for threshold values so as to obtain the number of coefficients among sixty-four DCT coefficients whose absolute components are larger or smaller than the threshold values

A picture that is an I-picture in coding processing in the previous stage has a

tendency that more DCT coefficients are generated which have values of 0 or those in the vicinity of 0, compared with a P-picture or a B-picture. FIG. 5 shows a time transition of the number of DCT coefficients whose absolute values are larger than threshold values Circles in FIG. 5 represent positions where I-pictures are obtained in coding processing in the previous stage The picture type detector 52 detects a picture, as an I-picture, which has a smaller number of DCT coefficients larger than threshold values or which has a larger number of DCT coefficients smaller than threshold values, compared with the previous and subsequent pictures.

Furthermore, a detection precision can also be enhanced by combining Embodiments 1 and 2. For example, by using FIGS. 3 and 5 together, a detection precision of an I-picture can be further enhanced. Furthermore, a P-picture can be specifically detected by using FIGS. 4 and 5

Furthermore, the pre-processing portion 13 may extract a part of a screen and input it, instead of inputting the entire input image signal to the DCT unit 50 A processing amount can be reduced.

Furthermore, in Embodiments 1 and 2, the pre-processing portion 13 and the coding portion 12 have been described separately. However, the coding portion 12 and the pre-processing portion 13 can also share the same DCT unit. In this case, the circuit of the DCT unit can be reduced.

Furthermore, even with an input image signal processed as an I-picture in the coding portion 12 or an input image signal processed as a P-picture or a B-picture in the coding portion 12, the same DCT coefficients as those output from the DCT unit 50 in the pre-processing portion are generated in the coding portion 12 with respect to a